Appendix F

Airport Capacity Design Teams
Potential Savings from Recommended Airfield Improvements

This appendix expands on the summary material in Table 2-4. Estimates of savings are in hours of delay and millions of dollars for selected airfield improvements recommended by various Airport Capacity Design Teams. Estimates are given based upon demand at current (baseline) levels and future projections.

Atlanta-Hartsfield International Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	750,000	Future 1	780,000	Future 2	796,500
	Delay (aircraft hours/year): (without improvements)	Baseline	165,000	Future 1	200,400	Future 2	216,400

	Recommended Improvement	Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	Fifth concourse		17.1	12.3	$60.0
			$25.7	$18.4	
(2)	Commuter/GA terminal and runway complex south of Runway 9R/27L		119.4	134.7	$100.0
			$179.1	$202.1	

Charlotte/Douglas International Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	430,000	Future 1	520,000	Future 2	600,000
	Delay (aircraft hours/year): (without improvements)	Baseline	19,100	Future 1	38,000	Future 2	71,400

	Recommended Improvement	Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	Build a third parallel runway, Runway 18W/36W				
(1A)	Two IFR arrival streams	6.6	12.4	24.5	
		$9.3	$17.3	$34.3	
(1B)	Three IFR arrival streams (one dependent)	7.4	14.7	29.3	
		$10.3	$20.6	$41.0	
(1C)	Three independent IFR arrival streams	7.5	15.1	30.1	
		$10.5	$21.1	$42.2	
(2)	Build a fourth parallel runway, Runway 18E/36E	—	—	8.7	
		—	—	$12.2	

Detroit Metropolitan Wayne County Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	409,000	Future 1	500,000	Future 2	600,000
	Delay (aircraft hours/year): without improvements)	Baseline	81,700	Future 1	178,400	Future 2	423,800

	Recommended Improvement	Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	Construct independent crosswind Runway 9R/27L	54.99	104.93	201.90	
		$85.3	$173.1	$366.4	
(2)	Construct independent fourth north/south runway	3.32	6.97	25.46	
		$5.1	$11.5	$46.5	

Kansas City International Airport Capacity Design Team Project Summary

Demand Level: (annual operations)	Baseline	212,000	Future 1	260,000	Future 2	325,000	Future 3	450,000
Delay: (aircraft hours/year) (without improvements)	Baseline	5,000	Future 1	*	Future 2	*	Future 3	235,000

Recommended Improvement	Baseline	Future 1	Future 2	Future 3	Development Cost (000,000)
(1) New N/S 9500' independent runway Runway 1R/19L	2.7 $2.8	8.3 $8.6	28.2 $29.1	176 $181.8	$48.3
(2) New dependent 10,000' parallel Runway 9R/27L				3.6 $3.7	$40.9
(3) New independent 10,000' parallel Runway 18R/36L	— —	— —	.2 $ .2	4.9 $5.1	$46.3
(4) New dependent 10,000' parallel Runway 18L/36R					$40.9
(11) High speed exit for Runway 27R				1.3 $1.4	$.7

Memphis International Airport Capacity Design Team Project Summary

Demand Level: (annual operations)	Baseline	382,000	Future 1	440,000	Future 2	510,000
Delay (aircraft hours/year): (without improvements)	Baseline	15,826	Future 1	28,380	Future 2	64,630

Recommended Improvement	Baseline	Future 1	Future 2	Development Cost (000,000)
(1) Construct Runway 18E/36E, dual departures		3.094 $5.1	6.255 $10.4	
(2) Construct Runway 18E/36E, triple departures in VFR-1		8.997 $14.9	19.988 $33.2	
(3) Construct Runway 18E/36E, triple departures in all weather conditions (waiver required)		10.356 17.2	23.359 $38.8	
(7) Extend Taxiway A from B to BB for existing runways		1.244 $2.1	1.261 $2.1	
(12) Angled exits on Runway 18R/36L (reduce occupancy times by 10%)	0.147 $0.3	.234 $.4	0.620 $1.0	

Miami International Airport Capacity Design Team Project Summary

Demand Level: (annual operations)	Baseline	326,825	Future 1	390,700	Future 2	421,700	Future 3	532,700
Delay: (aircraft hours/year) (without improvements)	Baseline	7,300	Future 1	10,800	Future 2	17,260	Future 3	46,500

Recommended Improvement	Baseline	Future 1	Future 2	Future 3	Development Cost (000,000)
(1) Dual taxiway around Concourse H (remove 2 end gates)	$0.13			$5.00	$2.5
(2) Extend Taxiway L to end of Runway 9L	$0.09			$12.75	$.35
(3) Construct new partial dual Taxiway K	$1.50				$1.8
(4) Develop improved exits for Runway 9L/27R northside	$0.49			$21.30	$1.2
(4a) Strengthen/reconstruct Runway 9L/27R					$6.2
(5) Improve Exits M4 and M5 on Runway 9L/27R	$1.60			$1.90	$1.5

Orlando International Airport Capacity Design Team Project Summary

Demand Level: (annual operations)	Baseline	294,000	Future 1	400,000	Future 2	600,000
Delay (aircraft hours/year): (without improvements)	Baseline	9,835	Future 1	24,076	Future 2	122,254

Recommended Improvement	Baseline	Future 1	Future 2	Development Cost (000,000)
(1) Extend Taxiway C to threshold of Runway 36R				$3.2
(3) North crossfield taxiway	$2.9	$3.9	$6.0	$26.0
(4a) New Taxiway B9 from Runway 36R to Runway 36L				
(4b) New Taxiway B9 from Taxiway A to threshold of Runway 36L				
(5) Staging areas at all runway ends	$.3	$.3	$6.3	$3.0
(6) Fourth runway and associated taxiways		$1.4	$47.3	$100.0

Phoenix-Sky Harbor International Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	465,000	Future 1	550,000	Future 2	650,000
	Delay (aircraft hours/year): (without improvements)	Baseline	45,741	Future 1	108,518	Future 2	701,296

	Recommended Improvement	**Baseline**	**Future 1**	**Future 2**	**Development Cost (000,000)**
(1)	Construct new runway 800' south of Runway 8R/26L	25.03 $27.03	56.44 $60.95	370.36 $399.99	$28.0
(2)	Construct run-up pads at two runway ends				$2.3
(3)	Widen fillets at Taxiways C5 and C7 off Runway 8R/26L	0.58 $0.63	3.05 $3.30	21.63 $23.37	$0.5
(4)	Construct holding area southeast of Terminal 3				$0.5
(5)	Construct angled exit off of Runway 8R/26L between Taxiways C3 and C4 to Taxiway C	0.71 $0.76	3.46 $3.73	30.03 $32.44	$0.4
(6)	Construct angled exit off of Runway 8S/26S between Taxiways D3 and D5 to Taxiway D	0.05 $0.06	0.15 $0.16	0.24 $0.27	$0.4
(7)	Construct second midfield crossover Taxiway Y adjacent to Taxiway X	7.72 $8.34	24.02 $25.95	150.61 $162.66	$7.5
8)	Construct crossover Taxiway W at ends of Runways 26R and 26L	3.38 $3.65	11.00 $11.88	88.24 $95.30	$6.5
(9)	Construct crossover Taxiway Z west of Terminal 1 (from Exit B3 to Exit C3)	5.69 $6.15	12.77 $13.79	76.28 $82.38	$4.1
(10)	Construct Terminal 4 (77 gates) and remove Terminal 1	9.56 $10.31	30.79 $33.26	207.31 $223.89	$287.0
(11A)	Extend Taxiway A to end of Runway 26R				$1.2
(12)	Complete northside taxilane (parallel to Taxiway C) from end of Runway 8R to crossover Taxiway X				$4.9
(13)	Relocate ANG south of Runway 8R/26L				$60.0

Lambert St. Louis International Airport Capacity Design Team Project Summary

	Demand Level:	Baseline	530,000	Future 1	585,000	Future 2	740,000
	(annual operations)						
	Delay (aircraft hours/year):	Baseline	158,000	Future 1	305,000	Future 2	875,000
	(without improvements)						

Recommended Improvement	**Baseline**	**Future 1**	**Future 2**	**Development Cost (000,000)**
(1) New runway parallel to Runway 12L/30R				
(1A) Alternate 1: New independent commuter runway 2500' from Runway 12L/30R	94 $139	154 $228	617 $913	$8
(1B) Alternate 2: New dependent commuter runway 1400' from Runway 12L/30R	84 $124	137 $203	577 $853	$7.8
(1C) Alternate 3: New independent air carrier runway parallel to Runway 12L/30R	132 $195	203 $300	693 $1025	$30.0
(2) Convert Taxiway F to permanent VFR Runway 13/31	21 $30	37 $55	313 $463	$0.9
(3) Angled exits on Runway 12L/30R	1.7 $2.5	2.8 $4.1	27 $40	$2.5
(4) Taxiway extensions				
(4A) Extend Taxiway A south to end of Runway 30L	12 $18			$3.0
(4B) Extend Taxiway P from Taxiway C to Taxiway M	11 $16			$1.3
(4C) Extend Taxiway C from Taxiway F to end of Runway 24	14 $20	17 $26		$2.0
(6) Establish queuing areas at various runway ends				$7.5
(7) Relocate cargo area	3.0 $4.5			$2.0

Salt Lake City International Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	269,600	Future 1	351,000	Future 2	418,000
	Delay (aircraft hours/year): (without improvements)	Baseline	14,900	Future 1	51,350	Future 2	104,000

Recommended Improvement		Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	New independent air carrier runway to west with CAT III on both ends		28.84 $31.4	61.67 $67.19	$80.7
(4)	Revised taxiway exit layout	.6 $.65	1.77 $1.93	4.11 $4.50	$2.4
(8)	Rehab Taxiways X and Y	.18 $.19			$4.2

Seattle-Tacoma International Airport Capacity Design Team Project Summary

	Demand Level: (annual operations)	Baseline	320,000	Future 1	390,000	Future 2	425,000
	Delay (aircraft hours/year): (without improvements)	Baseline	48,000	Future 1	168,000	Future 2	241,000

Recommended Improvement		Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	Runway alternates:				
	(a) Convert Taxiway D to 5000' commuter Runway 17C/35C with associated taxiway system	6.03 $8.69	43.65 $62.84	66.19 $95.31	$10.0
	(b) Dependent air carrier 7000' Runway 16W/34W 2500' from Runway 16L/34R	32.86 $47.30	121.81 $175.41	167.39 $241.04	$250.0
	(c) Independent air carrier 7000' runway 2500' from Runway 16L/34R	37.49 $53.98	141.93 $204.39	196.57 $283.06	$250.0
(2)	Taxiway construction:				
	(a) High speed exits and other taxiways	2.26 $3.25	4.34 $6.25	6.23 $8.97	$8.0

Washington Dulles International Airport Capacity Design Team Project Summary

	Demand Level (annual operations)	Baseline	320,000	Future 1	400,000	Future 2	450,000
	Delay (aircraft hours/year): (without improvements)	Baseline	7,541	Future 1	17,246	Future 2	28,731

Recommended Improvement		Baseline	Future 1	Future 2	Development Cost (000,000)
(1)	Add Runway 1W/19W 3500' west of Runway 1L/19R, with full ILS	—	3.86 $5.3	6.23 $8.5	
(2)	Add Runway 12R/30L 4300' south of Runway 12/30, with full ILS	—	3.60 $4.9	8.37 $11.4	